WHAT IS CLAIMED IS:

1. An optical limiter device comprising:

an optically transmissive substrate; and

a layer on a first surface of the substrate, the layer including a trimetallic nitride endohedral metallofullerene.

2. The optical limiter device of claim 1, wherein the layer includes one or more of: a thin film including the trimetallic nitride endohedral metallofullerene, a layer material with a cavity containing a solution including the trimetallic nitride endohedral metallofullerene, a sol-gel containing a trimetallic nitride endohedral metallofullerene, and a self assembled monolayer containing a trimetallic nitride endohedral metallofullerene.

3. The optical limiter device of claim 2, wherein the layer a thin film consisting essentially of the trimetallic nitride endohedral metallofullerene.

4. The optical limiter device of claim 1, wherein the trimetallic nitride endohedral metallofullerene has a general formula $A_{3-n}X_nN@C_m$, wherein n ranges from 0 to 3, A and X are a trivalent metal, m is between about 60 and about 200, and N is a heteroatom/ion.

5. The optical limiter device of claim 1, wherein N is nitrogen.

6. The optical limiter device of claim 4, wherein the trivalent metal is a rare earth metal or a group IIIB metal.

7. The optical limiter device of claim 6, wherein A is selected from the group consisting of Scandium, Yttrium, Lanthanum, Gadolinium, Holmium, Terbium, Erbium, Thulium, and Ytterbium.

8. The optical limiter device of claim 7, wherein A is selected from the group consisting of Terbium, Erbium, Holmium, Scandium and Yttrium.

9. The optical limiter device of claim 6, wherein X is selected from the group consisting of Scandium, Yttrium, Lanthanum, Gadolinium, Holmium, Terbium, Erbium, Thulium, and Ytterbium.

10. The optical limiter device of claim 1, wherein the substrate is a glass.

11. The optical limiter device of claim 10, wherein the substrate is quartz or a chalcogenide glass.

12. The optical limiter device of claim 1, wherein the layer has a thickness of one monolayer of the trimetallic nitride endohedral metallofullerene to 1 mm.

13. The optical limiter device of claim 12, wherein the thickness is from about 1 nm to 1 micron.

14. The optical limiter device of claim 1, wherein the layer is a patterned layered.

15. A method of forming an optical limiter device, the method comprising;

forming a layer including a trimetallic nitride endohedral metallofullerene on a substrate by a technique selected from the group consisting of a vapor deposition technique, a solution technique and a self-assembled monolayer technique.

16. The method of claim 15, wherein the vapor deposition technique includes physical vapor deposition, chemical vapor deposition, laser assisted deposition, molecular beam evaporation.

17. The method of claim 15, wherein the solution technique includes evaporation from solution, electrochemical deposition, electrophoretic deposition.

18. The method of claim 15, wherein the solution technique includes encapsulating a solution containing the trimetallic nitride endohedral metallofullerene in a cavity in the layer.

19. The method of claim 15, wherein the self-assembled monolayer technique includes forming a layer of a functionalized molecule on the substrate, the functionalized molecule modified for improved solubility in an aqueous or non-aqueous solvent.

20. The method of claim 19, wherein functionalized molecule preferentially binds to the trimetallic nitride endohedral metallofullerene and/or to a first surface of the substrate.

21. The method of claim 15, wherein the trimetallic nitride endohedral metallofullerene has a general formula $A_{3-n}X_nN@C_m$, wherein n ranges from 0 to 3, A and X are a trivalent metal, m is between about 60 and about 200, m is between about 60 and about 200, and N is a heteroatom/ion.

22. The method of claim 21, wherein N is nitrogen.

23. The method of claim 21, wherein the trivalent metal is a rare earth metal or a group IIIB metal.

24. The method of claim 23, wherein A is selected from the group consisting of Scandium, Yttrium, Lanthanum, Gadolinium, Holmium, Terbium, Erbium, Thulium, and Ytterbium.

25. The method of claim 24, wherein A is selected from the group consisting of Terbium, Erbium, Holmium, Scandium and Yttrium.

26. The method of claim 23, wherein X is selected from the group consisting of Scandium, Yttrium, Lanthanum, Gadolinium, Holmium, Terbium, Erbium, Thulium, and Ytterbium.

27. The method of claim 15, wherein the substrate is a glass.

28. The method of claim 27, wherein the substrate is quartz or a chalcogenide glass.

29. The method of claim 15, wherein the layer is deposited to a thickness of one monolayer of the trimetallic nitride endohedral metallofullerene to 1 mm.

30. The method of claim 27, wherein the thickness is from about 1 nm to 1 micron.

31. The method of claim 15, comprising patterning the layer.

32. The method of claim 31, wherein patterning includes masking or photolithography.